

## CLAIMS:

1. A gateway apparatus for conducting connection between a first communication network and a second communication network of respective different types, said apparatus comprising:

5 decision means for deciding on whether data from at least one of said first and second communication networks has been delayed in arrival or lost; and

control means for performing control so that, if the result of said decision indicates that the data from at least one of said  
10 first and second communication networks has been delayed in arrival or lost, data for causing a destination terminal of transmission on the other communication network to execute error concealment processing is generated or data acquired is discarded.

2. The gateway apparatus according to claim 1 wherein

said first communication network is a line-switched network; and

said second communication network is a packet-switched  
5 network; and wherein

said apparatus comprises:

first decision means for deciding on whether encoded data from said line-switched network has been delayed in arrival or lost; and

10 first control means for performing control so that, if the

result of said decision indicates that said encoded data has been delayed in arrival or lost, encoded data for causing a destination terminal of transmission on said packet-switched network to execute error concealment processing is generated  
15 or the encoded data acquired is discarded.

3. The gateway apparatus according to claim 1 or 2, wherein said first communication network is a line-switched network; and

said second communication network is a packet-switched  
5 network; and wherein

said decision means comprises:

second decision means for deciding on whether encoded data from said packet-switched network have been delayed in arriving or lost; and

10 second control means for performing control so that, if the result of said decision indicates that the encoded data from said line-switched network has been delayed in arrival or lost, encoded data for causing a destination terminal of transmission on the side of said line-switched network to execute error  
15 concealment processing is generated, or the encoded data delayed in arrival is discarded.

4. A gateway apparatus for conducting connection between a first communication network and a second communication network of respective different types, said apparatus comprising:

5           decision means for deciding on whether encoded data from at least one of said first and second communication networks has been delayed in arrival or lost;

          control means for performing control so that, if the result of said decision indicates that the encoded data from at least  
10 one of said first and second communication networks has been delayed in arrival or lost, data is generated by error concealment processing, or data acquired is discarded;

          decoding means for decoding encoded data from said at least one communication network, processed by said control  
15 means, and for outputting the resulting decoded data; and

          encoding means for encoding the data obtained from said error concealment processing by said control means, and said decoded data, in accordance with an encoding system different from the encoding system for said encoded data from said one  
20 communication network.

5.       The gateway apparatus according to claim 4, wherein

          said first communication network is a line-switched network; and wherein

          said second communication network is a packet-switched  
5 network;

          said apparatus comprising:

          first decision means for deciding on whether the encoded data from said line-switched network have been delayed in arrival or lost;

10           first control means for performing control so that, if the  
result of decision indicates that the encoded data from said  
line-switched network has been delayed in arrival or lost, data  
is generated by error concealment processing, or the acquired  
encoded data is discarded;

15           first decoding means for decoding the encoded data from  
said line-switched network, as processed by said first control  
means, and for outputting the resulting decoded data; and

            first encoding means for encoding the data obtained from  
said error concealment processing from said first control means  
20 and said decoded data from said first decoding means in  
accordance with an encoding system different from the  
encoding system for said encoded data from said line-switched  
network.

6.       The gateway apparatus according to claim 4 or 5, wherein  
          said first communication network is a line-switched  
network; and

          said second communication network is a packet-switched  
5 network; and wherein

          said apparatus comprises:

          second decision means for deciding on whether the  
encoded data from said packet-switched network have been  
delayed in arrival or lost;

10           second control means for performing control so that, if  
the result of decision indicates that the encoded data from said

line-switched network has been delayed in arrival or lost, data is generated by error concealment processing, or the acquired encoded data is discarded;

15           second decoding means for decoding the encoded data from said packet-switched network, as processed by said second control means, and for outputting the resulting decoded data; and

            second encoding means for encoding the data obtained  
20 from said error concealment processing from said second control means and said decoded data from said second decoding means in accordance with an encoding system different from the encoding system for said encoded data from said packet-switched network.

7.     The gateway apparatus according to claim 2 or 5, wherein said first decision means compares the encoded data actually acquired per period from said line-switched network and a pre-calculated expected value, that is, the number of encoded  
5 data expected to be acquired per period, and gives a decision, based on the result of comparison, on whether the encoded data from said line-switched network have been delayed in arrival or lost.

8.     The gateway apparatus according to claim 2, wherein  
            said first decision means includes a first decision circuit for receiving and counting encoded data output from a multiplexed data demultiplexing circuit, demultiplexing

5 multiplexed data from said line-switched circuit, for comparing the number of encoded data acquired per period with an expected value, that is, the number of said encoded data expected to be output from said multiplexed data demultiplexing circuit per period;

10 for outputting said encoded data received from said multiplexed data demultiplexing circuit if the number of the encoded data acquired is equal to said expected value;

for outputting, along with said encoded data acquired from said multiplexed data demultiplexing circuit, a generation  
15 request signal for generating the data in deficit in case the number of the encoded data acquired is less than said expected value; and

for outputting, along with said encoded data acquired from said multiplexed data demultiplexing circuit, a discarding  
20 request signal for discarding the encoded data in excess if the number of the encoded data acquired is less than said expected value;

said first control means including a first selection circuit for receiving at least one of said encoded data, said generation  
25 request signal and the discarding request signal, output from said first decision circuit;

for outputting, in case of receiving only said encoded data from said first decision circuit, said encoded data received;

30           for issuing a command, in case of receiving said generation request signal, for forming data in deficit; and

          for discarding, in case of receipt of said discarding request signal, said encoded data in excess, indicated by said discarding request signal, out of the encoded data received, and  
35   for outputting remaining portions of said encoded data; and

          a first encoded data generating circuit for generating encoded data for causing a destination terminal of transmission to execute error concealment processing responsive to a command from said first selection circuit.

9.     The gateway apparatus according to claim 3 or 6, wherein  
          said second decision means checks whether or not packet data from said packet-switched network can be acquired from a receiving circuit, at every preset period, extracts the encoded  
5   data from said packet data in case said packet data has been acquired from said receiving circuit and decides that said encoded data has been delayed in arrival or lost in case said packet data has failed to be acquired.

10.    The gateway apparatus according to claim 3, wherein said second decision means includes:

          a timer circuit for outputting a processing start request signal at a preset period;

5        an encoded data extraction circuit for making a trial to get packet data from a receiving circuit receiving packet data from said packet-switched network, at a time moment of receipt

of a processing start request signal from said timer circuit or a re-acquisition request signal;

10           for extracting encoded data from said packet data in case said trial has met with success; and

          for outputting a signal to the effect that said packet data has failed to be acquired, in case said trial to get said packet data from said receiving circuit has failed; and

15           a second decision circuit for outputting a generation request signal for causing a destination terminal of transmission to execute error concealment processing in case the signal received from said encoded data extraction circuit is a signal to the effect that said packet data has failed to be  
20   acquired;

          for receiving the encoded data extracted by said encoded data extraction circuit and for outputting the encoded data received from said encoded data extraction circuit in case said encoded data extraction circuit has not output the generation  
25   request signal just before; and

          for outputting, along with encoded data, received this time from the encoded data extraction circuit, a discarding request signal to the effect that said encoded data shall be discarded, if the result of previous decision indicates that said  
30   encoded data extraction circuit has output the generation request signal, and the encoded data, received this time, is the encoded data to be processed at an output timing of said



generation request signal, and for outputting a re-acquisition  
signal for requesting again the encoded data to said encoded  
35 data extraction circuit; and wherein

said second control means includes:

a second selection circuit for outputting encoded data in  
case only said encoded data has been received from said second  
decision circuit, for issuing a command to execute error  
40 concealment processing in case of receipt of said generation  
request signal from said second decision circuit, for deleting a  
relevant amount of the encoded data received from said second  
decision circuit in case of receiving said discarding request  
signal from said second decision circuit, and for outputting  
45 remaining portions of said encoded data; and

a second encoded data generating circuit responsive to  
said command for executing the error concealment processing  
from said second selection circuit to generate encoded data  
necessary for a terminal on the line-switched network to carry  
50 out the error concealment processing.

11. The gateway apparatus according to claim 5, wherein

said first decision means includes

a first decision circuit for receiving and counting  
encoded data output from a multiplexed data demultiplexing  
5 circuit for demultiplexing multiplexed data received from said  
line-switched network, for comparing the number of encoded  
data acquired per period with an expected value, that is, the

number of the encoded data expected to be output from said multiplexed data demultiplexing circuit per period;

10       for outputting said encoded data received from said data multiplexing circuit if the result of comparison indicates that the number of the encoded data acquired is equal to said expected value;

15       for outputting, if the number of said encoded data acquired is less than said expected value, a generation request signal for generating data in deficit, along with said encoded data acquired from said multiplexed data demultiplexing circuit; and

20       for outputting, if the number of said encoded data acquired is greater than said expected value, a discarding request signal for discarding data in excess, along with said encoded data acquired from said multiplexed data demultiplexing circuit; and wherein

said first control means includes

25       a first selection circuit for receiving at least one of said encoded data, said generation request signal and said discarding request signal, from said first decision circuit;

30       for outputting, in case of receipt only of said encoded data from said first decision circuit, said encoded data received;

for issuing a command for forming the data in deficit, in case of receipt of said generation request signal; and

for discarding, in case of receipt of said discarding request signal, a number of the encoded data received, indicated by said discarding request signal, and for outputting the remaining portions of said encoded data; and

a first error concealment processing circuit for receiving the command from said first selection circuit for generating data by error concealment processing;

said first decoding means including a first decoding circuit for decoding encoded data from said line-switched network, processed by said first selection circuit of said first control means, and for outputting decoded data;

said first encoding means including a first encoding circuit for encoding data obtained from said first decoding circuit and data obtained from said first error concealment processing circuit.

12. The gateway apparatus according to claim 6, wherein

said second decision means includes

a timer circuit for outputting a processing start request signal at a preset period;

an encoded data extraction circuit for making a trial to get packet data from a receiving circuit receiving packet data from said packet-switched network, at a time of receiving said processing start request signal from said timer circuit or a re-acquisition request signal;

for extracting encoded data from said packet data in case

said trial has met with success; and

for outputting a signal to the effect that said packet data has failed to be acquired, in case the trial to get the packet data from said receiving circuit has failed; and

15        a second decision circuit for outputting, in case the signal received from said encoded data extraction circuit is said signal to the effect that said packet data has failed to be acquired, a generation request signal for generating data by error concealment processing;

20        for receiving the encoded data extracted by said encoded data extraction circuit and for outputting the encoded data received from said encoded data extraction circuit in case said encoded data extraction circuit has output no generation request signal right before; and

25        for outputting, in case the result of decision indicates that said encoded data extraction circuit has output a generation request signal and the encoded data received this time from said encoded data extraction circuit is the encoded data which should be processed at an output timing of said  
30        generation request signal, said encoded data and, together therewith, a discarding request signal to the effect that said encoded data shall be discarded, and for outputting a re-acquisition request signal for requesting again encoded data to said encoded data extraction circuit;

35        said second control means including

a second selection circuit for outputting encoded data when only said encoded data has been received from said second decision circuit, for issuing a command for execution of error concealment processing in case of receiving a generation  
40 request signal from said second decision circuit and for deleting only relevant portions of the encoded data received from said second decision circuit and outputting remaining portions of said encoded data; and

a second error concealment processing circuit for  
45 generating data by error concealment processing;

said second decoding means including a second decoding circuit for decoding encoded data from the packet-switched network, processed by said second selection circuit of said second control means, to output decoded data;

50 said second encoding means including a second encoding circuit for encoding and outputting data obtained from said second decoding circuit and data obtained from said second error concealment processing circuit.

13. A gateway apparatus for conducting connection between a line-switched network and a packet-switched network, comprising:

a multiplexed data demultiplexing circuit for  
5 demultiplexing multiplexed data received from said line-switched network;

a data processing circuit for processing and packetizing

encoded data demultiplexed by said multiplexed data demultiplexing circuit to output the resulting packetized data;

10 and

a transmission circuit for transmitting packet data, output from said data processing circuit, to a packet-switched network;

said data processing circuit including:

15 a first decision circuit for receiving and counting encoded data output at each preset period from the multiplexed data demultiplexing circuit demultiplexing multiplexed data received from said line-switched network to compare the number of the encoded data acquired for each preset period  
20 with an expected value, that is, the number of encoded data expected to be output for each period from said multiplexed data demultiplexing circuit;

for outputting said encoded data received from said multiplexed data demultiplexing circuit if the number of the  
25 encoded data acquired is equal to said expected value;

for outputting, if the number of the encoded data acquired is less than said expected value, a generation request signal for generating data in deficit, along with said encoded data acquired from said multiplexed data demultiplexing  
30 circuit; and

for outputting, if the number of the encoded data acquired is greater than said expected value, a discarding

request signal for discarding data in excess, along with said encoded data acquired from said multiplexed data  
35 demultiplexing circuit;

a first selection circuit for receiving said encoded data, said generation request signal and the discarding request signal, output from said first decision circuit;

outputting, if only said encoded data is received, said  
40 encoded data received;

issuing a command for forming the data in deficit if said generation request signal is received; and

for discarding, in case of receipt of said discarding request signal, a number of the encoded data received, equal to  
45 the number indicated by said discarding request signal, and for outputting the remaining portions of the encoded data;

a first encoded data generating circuit for generating encoded data, responsive to said command from said first selection circuit, for causing a destination terminal of  
50 transmission on said packet-switched network to execute error concealment processing; and

a packet data forming circuit supplied with encoded data output from said first selection circuit and with encoded data output from said first encoding circuit generating circuit to  
55 convert the input encoded data into data of the packet data format.

14. A gateway apparatus for conducting connection between a

line-switched network and a packet-switched network,  
comprising:

a receiving circuit for receiving packet data from said  
5 packet-switched network;

a data processing circuit for receiving said packet data  
from said receiving circuit and extracting encoded data  
therefrom to output the resulting extracted data; and

a data multiplexing circuit for multiplexing an output of  
10 said data processing circuit to output resulting multiplexed data  
to a packet-switched network terminating circuit;

said data processing circuit including:

a timer circuit for outputting a processing start request  
signal at a preset period;

15 an encoded data extracting circuit for making a trial to  
get packet data from said receiving circuit at a time moment of  
receipt of the processing start request signal or the  
re-acquisition request signal from said timer circuit;

for extracting encoded data from said packet data in case  
20 said trial has met with success; and

for outputting a signal to the effect that the data has  
failed to be acquired, in case said trial in getting packet data  
from said receiving circuit has failed;

a second decision circuit for outputting a generation  
25 request signal for causing a destination terminal of  
transmission to execute error concealment processing, in case



the signal received from said encoded data extracting circuit indicates that the data has failed to be acquired;

for outputting encoded data received from said encoded  
30 data extracting circuit, if the encoded data extracted by said encoded data extracting circuit is received and said encoded data extracting circuit has output no generation request signal just before; and

for outputting, if the result of previous decision indicates  
35 that said encoded data extracting circuit has output said generation request signal and the encoded data received from said encoded data extracting circuit this time is encoded data to be processed with an output timing of said generation request signal, said encoded data and a discarding request signal  
40 indicating that said encoded data shall be discarded, and also for outputting a re-acquisition signal for requesting again the encoded data to said encoded data extracting circuit;

a second selection circuit for outputting encoded data, if  
said encoded data only has been received from said second  
45 decision circuit;

issuing a command for generating encoded data, if the generation request signal has been received from said second decision circuit; and

for deleting, if the discarding request signal is received  
50 from said second decision circuit, relevant portions of the encoded data received from said second decision circuit, and

outputting the remaining portions of said encoded data; and

a second encoded data generating circuit for generating encoded data necessary for a destination terminal of transmission of the line-switched network to execute error  
55 concealment processing;

the encoded data output from said second selection circuit and said second encoded data generating circuit being sent out to said line-switched network via said data multiplexing circuit.

15. The gateway apparatus according to claim 13, comprising:

a receiving circuit for receiving packet data from said packet-switched network;

a data processing circuit for receiving the packet data  
5 from said receiving circuit and extracting encoded data therefrom to output the encoded data extracted; and

a data multiplexing circuit for multiplexing an output of said data processing circuit to output the resulting data to a line-switched network terminating circuit;

10 said data processing circuit comprising:

a timer circuit for outputting a processing start request signal at a preset period;

an encoded data extracting circuit for making a trial to get packet data from said receiving circuit at a time moment of receiving the processing start request signal from said timer  
15 circuit or the re-acquisition request signal;

for extracting encoded data from said packet data in case

said trial has met with success; and

for outputting a signal to the effect that packet data has  
20 failed to be acquired, if the trial to get the packet data from  
said receiving circuit has failed;

a second decision circuit for outputting, if the signal  
received from said encoded data extracting circuit is the signal  
to the effect that packet data has failed to be acquired, a  
25 generation request signal for causing a destination terminal of  
transmission to execute error concealment processing;

for outputting encoded data received from said encoded  
data extracting circuit, if the encoded data extracted by said  
encoded data extracting circuit is received and the encoded data  
30 extracting circuit has output no generation request signal just  
before; and

for outputting, if the result of previous decision indicates  
that the encoded data extracting circuit has output said  
generation request signal and the encoded data received for the  
35 present from said encoded data extracting circuit is the encoded  
data which should be processed at an output timing of said  
generation request signal, said encoded data and a discarding  
request signal indicating that said encoded data shall be  
discarded, and for outputting a re-acquisition request signal for  
40 requesting again encoded data to said encoded data extracting  
circuit;

a second selection circuit for outputting said encoded

data if said encoded data only is received from said second decision circuit;

45       issuing a command for generating encoded data if a generation request signal has been received from said second decision circuit; and

          for deleting, in case of receipt of the discarding request signal from said second decision circuit, the relevant portions  
50 of the encoded data received from said second decision circuit, and outputting the remaining portions of the encoded data; and

          a second encoded data generating circuit for generating encoded data necessary for a destination terminal of transmission on the line-switched network to execute error  
55 concealment processing;

          the encoded data output from said second selection circuit and said second encoded data generating circuit being sent via said data multiplexing circuit to said line-switched network.

16. A gateway apparatus for conducting connection between a line-switched network and a packet-switched network and re-encoding input encoded data in accordance with another encoding system to output the re-encoded data, said apparatus  
5 comprising:

          a multiplexed data demultiplexing circuit for demultiplexing multiplexed data received from said line-switched network;

          a data processing circuit for processing encoded data of

10 the first encoding system, demultiplexed by said multiplexed data demultiplexing circuit, re-encoding said encoded data into data of the second encoding system, packetizing the resulting re-encoded data and outputting the resulting packet data; and

a transmission circuit for transmitting packet data output  
15 from said data processing circuit to said packet-switched network;

said data processing circuit including:

a first decision circuit for receiving and counting encoded data output from said multiplexed data demultiplexing  
20 circuit, for comparing the number of encoded data acquired per period with an expected value, that is, the number of the encoded data expected to be output from said multiplexed data demultiplexing circuit per period;

for outputting said encoded data received from said  
25 multiplexed data demultiplexing circuit, if the result of comparison indicates that the number of the encoded data acquired is equal to said expected value;

for outputting, if the number of said encoded data acquired is less than said expected value, a generation request  
30 signal for generating data in deficit, along with said encoded data acquired from said multiplexed data demultiplexing circuit; and

for outputting, if the number of said encoded data acquired is greater than said expected value, a discarding

35 request signal for discarding encoded data in excess, along with  
said encoded data acquired from said multiplexed data  
demultiplexing circuit;

a first selecting circuit for receiving at least one of said  
encoded data, said generation request signal and the discarding  
40 request signal, output from said first decision circuit, and  
outputting, if said encoded data only is received, the encoded  
data received;

for issuing a command for form data in deficit if said  
generation request signal is received; and

45 for discarding, in case of receipt of said discarding  
request signal, a number of the encoded data received  
corresponding to the number indicated by said discarding  
request signal, and outputting the remaining portion of the  
encoded data;

50 a first decoding circuit for receiving and decoding the  
encoded data output from said first selection circuit and  
outputting the decoded data;

a first error concealment processing circuit for outputting  
an amount of data indicated by said generation request signal,  
55 by error concealment processing, based on a command from said  
first selection circuit; and

a first encoding circuit for receiving decoded data from  
said first decoding circuit and data from said first error  
concealment processing circuit, as input, encoding the input

60 data in accordance with a second encoding system and  
outputting the resulting data; and

a packet data forming circuit for receiving the encoded  
data encoded in accordance with said second encoding system  
by said first encoding circuit, converting the data received into  
65 packet data and outputting the packet data to said transmission  
circuit.

17. A gateway apparatus for conducting connection between a  
line-switched network and a packet-switched network and  
re-encoding input encoded data in accordance with another  
encoding system to output the re-encoded data, said apparatus  
5 comprising:

a receiving circuit for receiving packet data from said  
packet-switched network;

a data processing circuit for receiving packet data from  
said receiving circuit, extracting encoded data encoded in  
10 accordance with a second encoding system, re-encoding the  
extracted data in accordance with a first encoding system, and  
outputting the resulting data; and

a data multiplexing circuit for multiplexing output data  
of said data processing circuit and outputting the resulting data  
15 to a line-switched network terminating circuit;

said data processing circuit including:

a timer circuit for outputting a processing start request  
signal at a preset period;

an encoded data extracting circuit for making a trial to  
20 get packet data from said receiving circuit at a time moment of  
receipt of a processing start request signal from said timer  
circuit or a re-acquisition request signal entered;

extracting encoded data, encoded in accordance with said  
second encoding system, from said packet data, if said trial has  
25 met with success; and

for outputting a signal to the effect that packet data has  
failed to be acquired, if said trial to get packet data from said  
receiving circuit has failed;

a second decision circuit for being supplied from said  
30 encoded data extracting circuit with encoded data or a signal to  
the effect that packet data has failed to be acquired, for  
outputting a generation request signal for causing a destination  
terminal of transmission of the line-switched network to  
execute error concealment processing, in case the signal  
35 received from said encoded data extracting circuit is a signal to  
the effect that packet data has failed to be acquired;

for receiving encoded data from said encoded data  
extraction circuit and outputting, if said encoded data  
extraction circuit has output no generation request signal right  
40 before, said encoded data received from said encoded data  
extraction circuit; and

for outputting, if the result of previous decision indicates  
that said encoded data extraction circuit has output said



generation request signal and the encoded data received for the  
45 present from said encoded data extraction circuit is encoded  
data which should be processed at an output timing of said  
generation request signal, said encoded data and a discarding  
request signal indicating that said encoded data shall be  
discarded, and for outputting a re-acquisition request signal for  
50 requesting again encoded data to said encoded data extraction  
circuit;

a second selection circuit for outputting, in case of  
receipt only of encoded data from said second decision circuit,  
said encoded data received;

55 for issuing a command for executing error concealment  
processing in case the generation request signal has been  
received from said second decision circuit; and

for deleting, in case of receipt of said discarding request  
signal from said second decision circuit, only relevant portions  
60 of the encoded data received from said second decision circuit,  
and outputting the remaining portions of the encoded data;

a second error concealment processing circuit for  
outputting data by error concealment processing based on a  
command from said second selection circuit;

65 a second decoding circuit for being supplied with  
encoded data output from said second selection circuit,  
decoding said encoded data entered and outputting the resulting  
decoded data; and

a second encoding circuit supplied with decoded data  
70 from said second decoding circuit and with data from said  
second error concealment processing circuit, as input, encoding  
the input data in accordance with a first encoding system of the  
destination of connection, and outputting the resulting encoded  
data;

75 the encoded data output from said second encoded data  
generating circuit being sent via said data multiplexing circuit  
to said line-switched network.

18. The gateway apparatus according to claim 16 comprising:

a receiving circuit for receiving packet data from said  
packet-switched network;

a data processing circuit for receiving packet data from  
5 said receiving circuit, extracting encoded data encoded in  
accordance with a second encoding system, re-encoding the  
received packet data in accordance with a first encoding system,  
and outputting the resulting data; and

a data multiplexing circuit for multiplexing output data  
10 of said data processing circuit to output the resulting data to a  
line-switched network terminating circuit;

said data processing circuit including

a timer circuit for outputting a processing start request  
signal at a preset period;

15 an encoded data extracting circuit for making a trial to  
get packet data from said receiving circuit at a time moment of

receipt of a processing start request signal from said timer circuit or a re-acquisition request signal entered;

extracting encoded data, encoded in accordance with said  
20 second encoding system, from said packet data, if said trial has met with success; and

for outputting a signal to the effect that packet data has failed to be acquired, if said trial to get packet data from said receiving circuit has failed;

25 a second decision circuit for being supplied from said encoded data extracting circuit with encoded data or a signal to the effect that packet data has failed to be acquired, for outputting a generation request signal for causing a destination terminal of transmission of the line-switched network to  
30 execute error concealment processing, in case the signal received from said encoded data extracting circuit is a signal to the effect that packet data has failed to be acquired;

for receiving encoded data from said encoded data extraction circuit and outputting, if said encoded data  
35 extraction circuit has output no generation request signal right before, said encoded data received from said encoded data extraction circuit; and

for outputting, if the result of previous decision indicates that said encoded data extraction circuit has output said  
40 generation request signal and the encoded data received for the present from said encoded data extraction circuit is encoded

data which should be processed at an output timing of said generation request signal, said encoded data and, together therewith, a discarding request signal indicating that said  
45 encoded data shall be discarded, and for outputting a re-acquisition request signal for requesting again encoded data to said encoded data extraction circuit;

a second selection circuit for outputting, in case of receipt only of encoded data from said second decision circuit,  
50 said encoded data received;

for issuing a command for executing error concealment processing in case the generation request signal has been received from said second decision circuit; and

for deleting, in case of receipt of said discarding request  
55 signal from said second decision circuit, only relevant portions of the encoded data received from said second decision circuit, and outputting the remaining portions of the encoded data;

a second error concealment processing circuit for outputting data by error concealment processing based on a  
60 command from said second selection circuit;

a second decoding circuit for being supplied with encoded data output from said second selection circuit, for decoding said encoded data entered and for outputting the resulting decoded data; and

65 a second encoding circuit for being supplied with decoded data from said second decoding circuit and with data

from said second error concealment processing circuit, as input,  
for encoding the input data in accordance with a first encoding  
system of the destination of connection, and outputting the  
70 resulting encoded data;

the encoded data output from said second encoded data  
generating circuit being sent via said data multiplexing circuit  
to said line-switched network.

19. The gateway apparatus according to claim 13 or 16,  
wherein a timer circuit for periodically outputting a signal for  
launching the processing of said multiplexed data  
demultiplexing circuit is provided outside of said data  
5 processing circuit.

20. The gateway apparatus according to any one of claims 14,  
15 and 17, wherein a timer circuit for periodically outputting a  
signal for launching the processing of said data multiplexing  
circuit is provided outside of said data processing circuit.

21. The gateway apparatus according to claim 15 or 18,  
wherein a timer circuit for periodically outputting a signal for  
launching the processing of said multiplexed data  
demultiplexing circuit and a signal for launching the processing  
5 of said data multiplexing circuit are provided outside of said  
data processing circuit.

22. The gateway apparatus according to any one of claims 2  
to 21, wherein said encoded data is speech encoded data.

23. The gateway apparatus according to any one of claims 8,

11, 13, 15 and 18, wherein said multiplexed data demultiplexing circuit demultiplexes the multiplexed data into speech data and control data or into speech data, image data  
5 and control data.

24. The gateway apparatus according to any one of claims 14, 15, 17 and 18, wherein said data multiplexing circuit multiplex speech data and control data or multiplex speech data, image data and control data.

25. A method for processing encoded data by a gateway apparatus for conducting connection between a first communication network and a second communication network of respective different types, said method comprising:

5 (a) a step of said gateway apparatus deciding on whether data from at least one of said first and second communication networks has been delayed in arriving or lost; and

(b) a step of said gateway apparatus generating data for causing a destination terminal of transmission to execute error  
10 concealment processing or discarding encoded data acquired, in case the result of said decision indicates that data from at least one of said first and second communication networks has been delayed in arrival or lost.

26. The method for processing encoded data by a gateway apparatus according to claim 25, wherein said first communication network is a line-switched network and said second communication network is a packet-switched network;

5    said method further comprising:

        (a1) a step of said gateway apparatus deciding on whether encoded data from said line-switched network has been delayed in arrival or lost; and

        (b1) a step of said gateway apparatus generating encoded  
10    data for causing a destination terminal of transmission to execute error concealment processing or discarding encoded data acquired in case the result of said decision indicates that data from said line-switched network has been delayed in arrival or lost.

27.    The method for processing encoded data by a gateway apparatus according to claim 25 or 26 wherein said first communication network is a packet-switched network and said second communication network is a line-switched network; said  
5    method further comprising:

        (a2) a step of said gateway apparatus deciding on whether encoded data from said packet-switched network has been delayed in arrival or lost; and

        (b2) a step of said gateway apparatus generating data for  
10    causing a destination terminal of transmission to execute error concealment processing or discarding encoded data acquired in case the result of said decision indicates that the encoded data from said packet-switched network has been delayed in arrival or lost.

28.    A method for processing encoded data by a gateway

apparatus for conducting connection between a first communication network and a second communication network of respective different types, comprising:

5 (a) a step of said gateway apparatus deciding on whether data from at least one of said first and second communication networks has been delayed in arriving or lost; and

(b) a step of said gateway apparatus generating data by error concealment processing or discarding encoded data  
10 acquired in case the result of said decision indicates that data from at least one of said first and second communication networks has been delayed in arrival or lost;

(c) a step of said gateway apparatus decoding encoded data from said at least one communication network, processed  
15 in said step (b), and outputting decoded data; and

(d) a step of said gateway apparatus encoding the data obtained by said error concealment processing and said decoded data in accordance with an encoding system different from that for encoded data from said one communication network and  
20 outputting the resulting data.

29. The method for processing encoded data by a gateway apparatus according to claim 28, wherein said first communication network is a line-switched network; and

said second communication network is a packet-switched  
5 network; said method further comprising:

(a1) a step of said gateway apparatus deciding on whether



encoded data from said line-switched network has been delayed in arrival or lost; and

(b1) a step of said gateway apparatus generating data by  
10 error concealment processing or discarding encoded data acquired in case the result of said decision indicates that the encoded data from said line-switched network has been delayed in arriving or lost;

(c1) a step of said gateway apparatus decoding encoded  
15 data from said line-switched network, processed in said step (b1) and outputting the resulting decoded data; and

(d1) a step of said gateway apparatus encoding the data obtained by said error concealment processing and said decoded data in accordance with an encoding system different from that  
20 for encoded data from said line-switched network and outputting the resulting data.

30. The method for processing encoded data by a gateway apparatus according to claim 28 or 29, wherein said first communication network is a line-switched network and said second communication network is a packet-switched network;  
5 said method further comprising:

(a2) a step of said gateway apparatus deciding on whether encoded data from said packet-switched network has been delayed in arrival or lost; and

(b2) a step of said gateway apparatus generating data by  
10 error concealment processing or discarding encoded data

delayed in arriving in case the result of said decision indicates that the encoded data from said line-switched network has been delayed in arrival or lost;

(c2) a step of said gateway apparatus decoding encoded  
15 data from said packet-switched network, processed in said step (b2), and outputting the resulting decoded data; and

(d2) a step of said gateway apparatus encoding the data obtained by said error concealment processing and said decoded data in accordance with an encoding system different from that  
20 for encoded data from said packet-switched network, and outputting the resulting data.

31. The processing method for processing encoded data by a gateway apparatus according to claim 26 or 29, wherein said step (a1) compares the number of encoded data actually acquired per period from said line-switched network with a  
5 pre-calculated expected value, that is, the number of the encoded data expected to be acquired per period and, based on the results of comparison, decides on whether the encoded data from said line-switched network has been delayed in arriving or lost.

32. The processing method for processing encoded data by a gateway apparatus according to claim 26, wherein said step (a1) includes:

(a11) a step of receiving and counting encoded data  
5 output from a multiplexed data demultiplexing circuit

demultiplexing multiplexed data received from said line-switched network and comparing the number of the encoded data acquired per period with an expected value, that is, the number of encoded data expected to be output per period from  
10 said multiplexed data demultiplexing circuit, and

(a12) a step of outputting, if the result of comparison indicates that the number of the encoded data acquired is equal to the number of said expected value, the encoded data received from said multiplexed data demultiplexing circuit;

15 outputting, if said result of comparison indicates that the number of the encoded data acquired is less than the number of said expected value, a generation request signal for generating data in deficit, along with said encoded data acquired from said multiplexed data demultiplexing circuit; and

20 outputting, if said result of comparison indicates that the number of the encoded data acquired is greater than the number of said expected value, a discarding request signal for discarding the encoded data in excess, along with said encoded data acquired from said multiplexed data demultiplexing  
25 circuit; and wherein

said step (b1) includes:

(b11) a step of receiving said encoded data, said generation request signal or said discarding request signal, output from said step (a12);

30 outputting, if said encoded data only is received, the

encoded data received;

issuing a command for forming data in deficit if said generation request signal is received; and

discarding, if said discarding request signal is received,  
35 a number of the encoded data received, corresponding to the number indicated by said discarding request signal, and outputting the remaining portion of said encoded data; and

(b12) a step of generating, responsive to the command for forming said data in deficit, the encoded data for causing a  
40 destination terminal of transmission to execute the error concealment processing.

33. The processing method for processing encoded data by a gateway apparatus according to claim 27 or 30, wherein

said step (a2) checks whether or not packet data from a packet-switched network can be acquired from a receiving  
5 circuit, for each preset period, extracts encoded data from said packet data if the packet data has been obtained from said receiving circuit, and gives a decision that the encoded data has been delayed in arriving or lost if said packet data has failed to be acquired.

34. The processing method for processing encoded data by a gateway apparatus according to claim 27, wherein

said step (a2) includes:

(a21) a step of making a trial to get packet data from a  
5 receiving circuit receiving packet data from said

packet-switched network, at a time moment of receipt of a processing start request signal output from a timer circuit at a preset period, or a re-acquisition request signal; and

extracting the encoded data from said packet data if said  
10 trial has met with success and outputting a signal to the effect that packet data has failed to be acquired if the trial of acquiring packet data from said receiving circuit has failed, by way of executing encoded data extracting processing;

(a22) a step of outputting a generation request signal for  
15 causing a destination terminal of transmission to execute error concealment processing in case an output of said step (a21) is said signal to the effect that packet data has failed to be acquired;

receiving the encoded data output in said step (a21) and  
20 outputting said encoded data output in said step (a21) if said generation request signal has failed to be output right before; and

outputting, if the result of previous decision indicates that the generation request signal has already been output in  
25 said step (a21) and the encoded data output in said step (a21) for the present is the encoded data which should be processed at an output timing of said generation request signal, said encoded signal and, together therewith, a discarding request signal indicating that said encoded data shall be discarded, and  
30 outputting a re-acquisition request signal for requesting again

the encoded data to said encoded data extracting processing of said step (a21); and wherein

said step (b2) includes:

(b21) a step of issuing a command for executing error  
35 concealment processing if said generation request signal is output from said step (a22), and deleting relevant portions of the encoded data output in said step (a22), as the remaining portions of the encoded data is output, in case the discarding request signal has been output in said step (a22); and

40 (b22) a step of generating encoded data necessary for a destination of transmission of the line-switched network to execute error concealment processing.

35. The processing method for processing encoded data by a gateway apparatus according to claim 29 wherein said step (a1) includes:

(a11) a step of receiving and counting encoded data  
5 output from a multiplexed data demultiplexing circuit demultiplexing multiplexed data received from said circuit-switched network and comparing the number of the encoded data acquired per period with an expected value, that is, the number of encoded data expected to be output per period  
10 from said multiplexed data demultiplexing circuit, and

(a12) a step of outputting, if the result of comparison indicates that the number of the encoded data acquired is equal to the number of said expected value, the encoded data received

from said multiplexed data demultiplexing circuit;

15           outputting, if said result of comparison indicates that the number of the encoded data acquired is less than the number of said expected value, a generation request signal for generating data in deficit, along with said encoded data acquired from said multiplexed data demultiplexing circuit; and

20           outputting, if said result of comparison indicates that the number of the encoded data acquired is greater than the number of said expected value, a discarding request signal for discarding the encoded data in excess, along with said encoded data acquired from said multiplexed data demultiplexing  
25 circuit; and wherein

          said step (b1) includes:

          (b11) a step of receiving said encoded data, said generation request signal or said discarding request signal, output from said step (a12);

30           outputting, if said encoded data only is received, the encoded data received;

          issuing a command for forming data in deficit if said generation request signal is received; and

          discarding, if said discarding request signal is received,  
35 a number of the encoded data received, corresponding to the number indicated by said discarding request signal, and outputting the remaining portion of said encoded data; and

          (b12) a step of generating data by error concealment

processing if a command for forming said data in deficit is  
40 issued from said step (b11);

(b13) a step of decoding encoded data output from said  
step (b11) to output the resulting decoded data; and

(b14) a step of receiving said decoded data and data  
resulting from said error concealment processing to generate  
45 encoded data encoded in accordance with an encoding system on  
the packet-switched network different from the encoding system  
for said encoded data received from said line-switched network.

36. The processing method for processing encoded data by a  
gateway apparatus according to claim 30, wherein said step (a2)  
includes:

(a21) a step of making a trial to get packet data from a  
5 receiving circuit receiving packet data from said  
packet-switched network, at a time moment of receipt of a  
processing start request signal output from a timer circuit,  
output at a preset period, or a re-acquisition request signal; and

extracting encoded data from said packet data in case  
10 said attempt of acquiring packet data from said receiving  
circuit has met with success and outputting a signal to the  
effect that packet data has failed to be acquired in case said  
trial has failed, by way of executing encoded data extracting  
processing; and

15 (a22) a step of outputting a generation request signal for  
executing error concealment processing in case an output from



said step (a21) is a signal to the effect that packet data has failed to be acquired;

receiving the encoded data output in said step (a21) and  
20 outputting said encoded data output in said step (a21) if said generation request signal has failed to be output right before; and

outputting, if the result of previous decision indicates that the generation request signal has already been output in  
25 said step (a21) and the encoded data output in said step (a21) for the present is the encoded data which should be processed at an output timing of said generation request signal, said encoded data and, together therewith, a discarding request signal indicating that said encoded data shall be discarded, and  
30 outputting a re-acquisition request signal for requesting again the encoded data to said encoded data extracting processing of said step (a21); and wherein

said step (b2) includes:

(b21) a step of issuing a command for executing error  
35 concealment processing if said generation request signal is output from said step (a22), and deleting relevant portions of the encoded data received from said second decision circuit, as the remaining portions of the encoded data are output, in case the discarding request signal has been output from said second  
40 decision circuit;

(b22) a step of decoding encoded data output from said

step (b21) to output the resulting decoded data; a sub-step of

(b23) a step of generating data by error concealment processing; and

45 (b24) a step of receiving said decoded data and data resulting from said error concealment processing and encoding the data in accordance with an encoding system on the line-switched network different from the encoding system for said encoded data received from said packet-switched network  
50 to output the encoded data.

37. A method for processing encoded data by a gateway apparatus for conducting connection between a line-switched network and a packet-switched network, wherein a data processing circuit for receiving and processing data output  
5 from a multiplexed data demultiplexing circuit demultiplexing multiplexed data from said line-switched network for outputting packet data via transmission circuit to said packet-switched network, includes:

(A1) a step of receiving and counting encoded data output  
10 from said multiplexed data demultiplexing circuit demultiplexing multiplexed data received from said line-switched network and comparing the number of the encoded data acquired per period with an expected value, that is, the number of encoded data expected to be output per period from  
15 said multiplexed data demultiplexing circuit;

(A2) a step of outputting, if the result of comparison

indicates that the number of the encoded data acquired is equal to the number of said expected value, the encoded data received from said multiplexed data demultiplexing circuit;

20           outputting, if said result of comparison indicates that the number of the encoded data acquired is less than the number of said expected value, a generation request signal for generating data in deficit, along with said encoded data acquired; and

          outputting, if said result of comparison indicates that the  
25   number of the encoded data acquired is greater than the number of said expected value, a discarding request signal for discarding the encoded data in excess, along with said encoded data acquired;

          (A3) a step of outputting said encoded data unchanged if,  
30   as a result of decision of the above step (A2), only said encoded data has been output;

          giving a command to create data in deficit if said generation request signal has been output; and

          discarding, in case of receipt of said discarding request  
35   signal, a number of received encoded data indicated by the number indicated by said discarding request signal, and outputting the remaining portions of the encoded data;

          (A4) a step of generating encoded data for causing a destination terminal of transmission to execute error  
40   concealment processing, in case said step (A3) has output a command for formulating data in deficit; and

(A5) a step of converting the encoded data output from said step (A3) or the encoded data for error concealment processing, output from said step (A4), into packet data, and  
45 outputting the resulting packet data to said transmission circuit.

38. A method for processing encoded data by a gateway apparatus for conducting connection between a line-switched network and a packet-switched network, wherein a data processing circuit for receiving packet data from a receiving  
5 circuit receiving packet data from said packet-switched network, for extracting encoded data and for outputting the encoded data extracted, to said line-switched network via a data multiplexing circuit, includes:

(B1) a step of making a trial to get packet data from said  
10 receiving circuit at a time moment of receipt of a processing start request signal output from a timer at a preset period, or a re-acquisition request signal, extracting encoded data from said packet data if said attempt of acquiring packet data from said receiving circuit has met with success, and outputting a signal  
15 to the effect that packet data has failed to be acquired if said trial has failed;

(B2) a step of outputting a generation request signal for having a terminal of the destination of the line-switched network execute error concealment processing in case a signal  
20 to the effect that packet data has failed to be acquired has been output from said encoding data extracting processing of said

step (B1), outputting the encoded data received from said encoded data extracting processing, if encoded data has been output from said encoded data extracting processing and no  
25 generation request signal has been output right before, outputting, if the result of decision for the present indicates that said generation request signal has been output and the encoded data output from the encoded data extracting circuit processing is the encoded data which should be processed at an  
30 output timing of said generation request signal, a discarding request signal, along with said encoded data, said discarding request signal indicating that said encoded data shall be discarded, and outputting a re-acquisition request signal for requesting again encoded data to said encoded data extracting  
35 processing;

(B3) a step of outputting, if encoded data only has been output from said step (B2), said encoded data output;

issuing a command to execute encoded data extracting processing if the generation request signal has been output  
40 from said step (B2), and

deleting only relevant portions of said encoded data if the discarding request signal has been output from said step (B2), and outputting remaining portions of the encoded data;

(B4) a step of generating encoded data needed for a  
45 destination terminal of transmission on the line-switched network to execute error concealment processing; and

(B5) a step of sending the encoded data, output from said step (B3), or the encoded data, output from said step (B4), via said multiplexed data demultiplexing circuit to said  
50 line-switched network.

39. A method for processing encoded data by a gateway apparatus for conducting connection between a line-switched network and a packet-switched network and re-encoding input encoded data in accordance with another encoding system to  
5 output the resulting re-encoded data, wherein

a data processing circuit packetizing data obtained on re-encoding encoded data of the first encoding system, demultiplexed by said multiplexed data demultiplexing circuit, in accordance with another encoding system, and outputting the  
10 resulting packetized data via a transmission circuit to said packet-switched network, includes:

(A1) a step of receiving and counting encoded data output from said multiplexed data demultiplexing circuit and comparing the number of the encoded data acquired per period  
15 with an expected value, that is, the number of encoded data expected to be output per period from said multiplexed data demultiplexing circuit,

(A2) a step of outputting, if the result of comparison indicates that the number of the encoded data acquired is equal  
20 to the number of said expected value, the encoded data received from said multiplexed data demultiplexing circuit;

outputting, if said result of comparison indicates that the number of the encoded data acquired is less than the number of said expected value, a generation request signal for generating  
25 data in deficit; and

outputting, if said result of comparison indicates that the number of the encoded data acquired is greater than the number of said expected value, a discarding request signal for discarding the encoded data in excess;

30 (A3) a step of outputting said encoded data if, as a result of decision of the step (A2), only said encoded data has been output;

giving a command to create data in deficit if said generation request signal has been output from said step (A2);  
35 and

discarding, in case of receipt of said discarding request signal from said step (A2), a number of received encoded data corresponding to the number indicated by said discarding request signal, and outputting the remaining portions of the  
40 encoded data;

(A4) a step of decoding the encoded data output from said step (A3) and outputting the resulting decoded step; a step of

(A5) a step of outputting encoded data of an amount indicated by said generation request signal, said encoded data  
45 generated by error concealment processing, based on a command output from said step (A3);

(A6) a step of encoding the decoded data generated by said step (A4) or the data generated in said step (A5), in accordance with said second encoding system, to output  
50 resulting data; and

(A7) a step of converting the data, encoded with said second encoding system, into packet data and outputting the resulting packet data to said transmission circuit.

40. A method for processing encoded data by a gateway apparatus for conducting connection between a line-switched network and a packet-switched network and re-encoding input encoded data in accordance with another encoding system to  
5 output the resulting re-encoded data, wherein

a data processing circuit receiving packet data from a receiving circuit receiving packet data from said packet-switched network, extracting encoded data encoded in accordance with a second encoding system, re-encoding the  
10 extracted encoded data with a second encoding system, and outputting the resulting re-encoded data via data multiplexing circuit to said line-switched network, includes:

(B1) a step making a trial to get packet data from said receiving circuit at a time moment of receipt of a processing  
15 start request signal from a timer circuit, or of a re-acquisition request signal entered, and extracting the encoded data, encoded in accordance with said second encoding system, from said packet data, if said trial has met with success, and



outputting a signal to the effect that packet data has failed to  
20 be acquired, if the trial of acquiring packet data from said  
receiving circuit has failed, by way of executing encoded data  
extracting processing;

(B2) a step of outputting a generation request signal for  
causing a destination terminal of transmission of the  
25 line-switched network to execute error concealment processing  
in case an signal to the effect that packet data has failed to be  
acquired is output from said encoded data extraction processing  
of said step (B1);

receiving the encoded data output from said encoded data  
30 extraction processing and outputting said encoded data received  
from said encoded data extracting processing if said encoded  
data extraction processing has failed to output said generation  
request signal right before; and

outputting, if the result of previous decision indicates  
35 that the generation request signal has already been output from  
said encoded data extracting processing and the encoded data  
output from said encoded data extracting processing for the  
present is the encoded data which should be processed at an  
output timing of said generation request signal, said encoded  
40 signal and, together therewith, a discarding request signal  
indicating that said encoded data shall be discarded, and  
outputting a re-acquisition request signal for requesting again  
the encoded data to said encoded data extracting processing;

(B3) a step of outputting, if said encoded data only is  
45 output from said step (B2), said encoded data output;

issuing a command for executing error concealment  
processing if said generation request signal is output from said  
step (B2), and

deleting relevant portions of the encoded data output, as  
50 the remaining portions of the encoded data is output, in case  
the discarding request signal has been output from said step  
(B2);

(B4) a step of outputting data by error concealment  
processing based on a command from said step (B3);

55 (B5) a step of decoding the encoded data output from the  
step (B3) to output the resulting decoded data;

(B6) a second encoding step of encoding the decoded data  
from said step (B5) or the data obtained by said error  
concealment processing of said step (B4) in accordance with  
60 the first encoding system on the destination of transmission,  
and outputting the resulting encoded data; and

(B7) a step of sending the encoded data of said first  
encoding system via said data multiplexing circuit to said  
line-switched network.

41. A method for processing encoded data from at least one  
communication network out of a line-switched network and a  
packet-switched network to the other communication network in  
a gateway system conducting connection between said

5 line-switched network and said packet-switched network of  
respective different types, said method comprising:

in case encoded data from at least one of said  
line-switched network and the packet-switched network has  
been delayed in arriving or lost, performing processing for  
10 generating data for causing a destination terminal of  
transmission on the other communication network to execute  
error concealment processing, or discarding the encoded data  
acquired to send said encoded data.

42. A gateway apparatus for conducting connection between a  
line-switched network and a packet-switched network,  
comprising:

a controller which compares the number of encoded data  
5 actually acquired in a preset period from said line-switched  
network, with an expected value, that is, the number of encoded  
data expected to be acquired in said period, generates encoded  
data, if the result of comparison indicates that the number of  
the encoded data actually acquired is less than said expected  
10 value, and which discards excess portions of the encoded data  
acquired if the result of comparison indicates that the number  
of the encoded data actually acquired is greater than said  
expected value, such that a number of the encoded data equal to  
said expected value per period are packetized, for performing  
15 control to maintain constant the number of the packet data sent  
to said packet-switched network per period.

43. The gateway apparatus according to claim 42, wherein said encoded data generated in case the number of the encoded data actually acquired is less than said expected value is the data used for the destination terminal of transmission to execute error concealment processing.

44. The gateway apparatus according to claim 42 or 43, wherein encoded data obtained on re-encoding following decoding of said encoded data is output to said packet-switched network.

45. A gateway apparatus for connecting a packet-switched network and a line-switched network, comprising:

an encoding data extracting unit which, if packets are not received from said packet-switched network at a preset period such that packet delay has been produced, and encoded data are to be extracted from packet data received, outputs a signal to the effect that packet data has failed to be acquired; and

a controller which generates or discards encoded data based on an output from said encoding data extracting unit to perform control for outputting encoded data to said line-switched network.

46. The gateway apparatus according to claim 45, wherein said encoded data generated based on an output from said encoded data extracting unit is the data for causing a destination terminal of transmission to execute error concealment processing.

47. The gateway apparatus according to claim 45 or 46. wherein the encoded data obtained on re-encoding following decoding of said encoded data is output to said line-switched network.